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REMARKS

Claims 1, 3, 7, 8, 11 and 14 are amended. Claims 1-15, as amended, remain in the application. No new matter is added by the amendments to the claims.

The Rejections:

In the Final Office Action dated April 20, 2007, the Examiner rejected Claims 1-15 under 35 U.S.C. 103(a) as being unpatentable over De Angelis (5,566,786) in view of LaNieve et al (5,437,899).

Regarding Claims 1, 3, 4 and 6 - 9, the Examiner stated that De Angelis discloses an elongated load-bearing support device (1) with load bearing strands (4), each having a plurality of fibers (5) of a base material in a first phase (aramid fibers (Col. 2, Line 38)) and the strands being surrounded by a sheath (7). The reinforcing material of De Angelis is of a second phase, yet it is externally applied to the base material as "... an impregnating medium, for example polyurethane solution, for the protection of the fibers 5" (Col.3, Line 57) whereby the bending fatigue strength of the strands is increased.

Attention is directed to LaNieve, as cited for reference in previous office actions, teach, "... polymers have been mixed with particulate matter and made into fibers..." (Col. 1, Line 54), whereby the particulate matter of their invention being "...an elemental metal or metal alloy, or may be nonmetallic..." (Col. 6, Line 14), whereby their polymer is an aromatic polyamide known as aramid. LaNieve et al teach further that such addition of particulate matter will enhance the flexural strength (modulus of elasticity in shear) of the fiber, with a minimized reduction in loss of tensile strength.

According to the Examiner, it would have been obvious to one of ordinary skill in the art to modify the base material of De Angelis with the teaching of LaNieve, in order to gain the features of materials of high flexural strength for applications whereby the material is to maintain a load while experiencing frequent/continuous radial deflection, for safety and durability.

Regarding Claim 2, the Examiner stated that De Angelis discloses his strands having a plurality of fibers (5) formed into a cable (4 and, in total, 1).

Regarding Claims 5 and 10, as noted above, LaNieve et al teach a reinforcing material as particulate matter, such as platelets and needles (Col. 6, Line 35).

Regarding Claims 11-15, the Examiner stated that the devices of Claims 1-10 would necessarily have to be formed in order to function. It would have been obvious to perform all the method steps of Claims 11-15 when producing the device of De Angelis as modified by LaNieve above, in a usual and expected fashion, in as much as the method claims recite no limiting steps beyond producing each of the components.

Regarding Claim 11, the Examiner stated that De Angelis discloses an elongated load-bearing support device (1) with fibers (5) from a base material in a first phase (aramid fibers) and a reinforcing material in a second phase ("... an impregnating medium, ...polyurethane solution), with the load-bearing strands (4) thereof being surrounded by a sheath (7). LaNieve et al teach further "... polymers have been mixed with particulate matter and made into fibers..."

Regarding Claim 12, the Examiner stated that De Angelis and LaNieve disclose a base material selected from aramid.

Regarding Claim 13, the Examiner stated that De Angelis discloses a reinforcing means by impregnation with a polyurethane solution to increase the bending fatigue strength of the base material, whereas LaNieve et al teach a reinforcing material as "...an elemental metal or metal alloy..." which is used to fill their base material.

Regarding Claim 14, the Examiner stated that LaNieve et al teach further that addition of particulate matter will enhance the flexural strength (modulus of elasticity in a radial direction).

Regarding Claim 15, the Examiner stated that LaNieve et al teach a reinforcing material as particulate matter, such as platelets and needles.

In the Advisory Action dated July 31, 2007, the Examiner stated that with respect to Applicant's arguments for Claim 1 and, notably, the reference of LaNieve, Applicant has accurately noted that LaNieve teaches that through the introduction of particles to "certain types of aromatic polyamide fibers", an enhancement of the cut-resistance, therein the flexural strength (modulus of elasticity in shear), is achieved at the expense of tensile strength - as acknowledged in the previous office action. However, the inventive feature of LaNieve is to provide enhanced cut-resistance while minimizing a reduction in tensile strength, as referenced in the previous

office actions. This enhancement in flexural strength anticipates the claim language of the instant invention, with respect to the pertinent Claims 1 and 3, "...whereby said reinforcing material increases a modulus of elasticity of the strands" and "... wherein...said reinforcing material increases a modulus of elasticity of each of said fibers in a longitudinal and/or radial direction of said fibers", respectively. LaNieve teaches such increase of modulus of elasticity in a radial direction.

Furthermore, with respect to cut-resistance, the benefit of this feature is reviewed in the specification of the instant invention (Page 6, Lines 8 - 11), wherein the lack of such resistance precludes the use of steel cable locks with cables made from synthetic fibers, in that the clamping forces of such cable locks overcome the "transverse strength" of the synthetic fiber of interest - aramid - resulting in a reduction in its "breakage load".

LaNieve teaches further, "The multicomponent aramid fibers of the invention can ... also exhibit excellent tensile strength" (Col. 3, Line 27), wherein a multicomponent fiber has "...at least two aromatic polyamide polymeric components, namely, an unfilled aromatic polyamide polymeric component and a filled aromatic polyamide polymeric component" (Col. 3, line 19) - the former and latter comprising a base material in a first phase, with a reinforcing material of a second phase distributed throughout the latter.

With respect to Applicant's comments to an abrasion of "downstream... equipment", though not pertinent to the claim language, LaNieve teaches that such abrasion is "significantly decreased (sic) ... resulting in a longer useful life for downstream manufacturing equipment" Conversely, the fiber of LaNieve offers an increase in (surface) wear resistance. (It should be noted that the downstream equipment as intended in the instant invention is one of pulleys/sheaves - not manufacturing equipment as used in the processing/spinning of synthetic fiber(s).)

Furthermore, Claim 1 fails to recite a specific fiber material, though the specification is nearly exclusive to the use of aramid as disclosed by De Angelis. Consequently, the claim language remains quite broad.

Finally, the cited art of record, notably Olesen et al and Mott, as reviewed in previous office actions remain pertinent to the applicant's disclosure and the claim language.

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The Response:

Applicant amended independent Claims 1, 7 and 11 to clarify that the reinforcing material increases a modulus of elasticity of the strands in a longitudinal direction of the fibers for supporting at least one of an elevator car and an elevator counterweight.

LaNieve teaches that the addition of particulate matter reduces the tensile modulus of elasticity of polymer fibers. In particular, LaNieve recites at Col. 2, Lines 28-39:

However, the addition of particles to certain types of aromatic polyamide fibers can have a severe detrimental impact on fiber tensile strength. In particular, the addition of particles to "para-aramid" fibers, such as Kevlar®, spun from lyotropic liquid crystal solutions, can significantly reduce the tenacity and elongation of the resulting fibers. It is believed the inclusion of such particles disrupts the liquid crystalline structure of the para-aramid fiber, thereby decreasing tensile strength. Still further, the presence of hard particles in aramid fibers generally can abrade downstream textile equipment. (Emphasis added)

A decrease of the tensile strength of the fibers for a rope in elevator equipment is absolutely unacceptable, because it can lead to the crash of the elevator car. Thus, the LaNieve document discourages dramatically the person skilled in the art of elevators seeking to increase the modulus of elasticity of elevator aramid ropes in the longitudinal direction from adding second phase particles into the polymer matrix of the fibers. US Patent No. 6,162,538 clearly leads the man skilled of the art away from the claimed invention.

According to the Examiner, LaNieve teaches "further that such addition of particulate matter will enhance the flexural strength of the fiber, while reducing its tensile strength (modulus of elasticity). This observation by the Examiner is confirmed in LaNieve at Col. 7, Lines 11-16. Thus, the combination suggested by the Examiner does not increase the modulus of elasticity in the longitudinal direction of the fibers as recited in Applicant's amended claims.

The Examiner stated that the prior art made of record and not relied upon is considered pertinent to Applicant's disclosure. The Examiner cited Sandt (5,576,081), Oleson et al (4,956,039) and Mott (Applied Strength of Materials, 4th Ed.) for an elongated structural

element filled with a polymer binder in liquid form with a dispersion of fiber reinforcement material; a cable-like composite body comprising a thermoplastic sleeve that "...is preferably filled with reinforcement elements having a high modulus of elasticity..." as well as a core string comprising a thermoplastic material with filaments of "...preferably E-.. S-glass..."; and a brief overview of composite structures addressing the impact of the amount, type, structure and orientation of reinforcing materials on both strength and modulus of elasticity, respectively. Applicant reviewed these references and found them to be no more pertinent than the prior art relied upon by the Examiner in the rejections.

Furthermore, the Examiner listed a July 2001 date for the Mott publication, but the second page of the copy lists a 2002 copyright date.

In view of the amendments to the claims and the above arguments, Applicant believes that the claims of record now define patentable subject matter over the art of record. Accordingly, an early Notice of Allowance is respectfully requested.